

## ABSTRACT

A  $\text{ZrO}_2\text{-Al}_2\text{O}_3$  composite ceramic material having high mechanical strength and toughness as well as excellent wear resistance and hardness is provided. This ceramic material includes a first phase of  $\text{ZrO}_2$  grains containing 10 to 12 mol% of  $\text{CeO}_2$  as a stabilizer and having an average grain size of  $0.1\mu\text{m}$  to  $1\mu\text{m}$ , and a second phase of  $\text{Al}_2\text{O}_3$  grains having an average grain size of  $0.1$  to  $0.5\mu\text{m}$ . The ceramic material has a mutual nano-composite structure formed under a condition that a content of the second phase in the ceramic material is within a range of 20 to 60 vol% such that the  $\text{Al}_2\text{O}_3$  grains are dispersed within said  $\text{ZrO}_2$  grains at a first dispersion ratio of 2% or more, and preferably 4% or more, which is defined as a ratio of the number of the  $\text{Al}_2\text{O}_3$  grains dispersed within the  $\text{ZrO}_2$  grains relative to the number of the entire  $\text{Al}_2\text{O}_3$  grains dispersed in the ceramic material, and the  $\text{ZrO}_2$  grains are dispersed within the  $\text{Al}_2\text{O}_3$  grains at a second dispersion ratio of 1% or more, which is defined as a ratio of the number of the  $\text{ZrO}_2$  grains dispersed within the  $\text{Al}_2\text{O}_3$  grains relative to the number of the entire  $\text{ZrO}_2$  grains dispersed in the ceramic material.